AMENDMENTS TO THE CLAIMS

1. (Currently amended) A pose estimation system for performing object pose estimation by comparing an input image with a three-dimensional object model, the pose estimation system comprising:

a pose candidate decision unit for generating at least one pose candidate;

a comparison image generation unit for generating, according to the generated pose candidate, a plurality of comparison images similar to the input image, while projecting the three-dimensional object model to a two-dimensional image;

a first sharpness extraction unit for extracting a first sharpness amount reflecting the sharpness from each of the plurality of comparison images;

a weighted difference calculator for calculating a plurality of weighted differences by weighting the first sharpness amount to the difference between the input image and each of the comparison images; [[and]]

a determination unit for selecting a comparison image having the smallest weighted difference among the plurality of weighted differences and estimating an optimal pose based on the selected comparison image; and

a second sharpness extraction unit for extracting a second sharpness amount reflecting the sharpness from the input image,

wherein the weighted difference calculator calculates a plurality of weighted differences by weighting the difference between the second sharpness amount of the input image and the first sharpness amount of each of the comparison images to the difference between the input image and the comparison image, and

wherein the first and second sharpness amounts are defined by a ratio of a number of pixels whose edge intensity is a threshold value or higher to the total number of pixels, a range of brightness values, dispersion of brightness values, or a number of characteristic points.

2. (Canceled)

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3. (Original) The pose estimation system according to Claim 1, wherein the weight becomes higher as the sharpness of the image becomes higher in the weighted difference calculation.

4. (Canceled)

5. (Currently amended) A [[The]] pose estimation system ~~according to Claim 2,~~ for performing object pose estimation by comparing an input image with a three-dimensional object model, the pose estimation system comprising:

a pose candidate decision unit for generating at least one pose candidate;

a comparison image generation unit for generating, according to the generated pose candidate, a plurality of comparison images similar to the input image, while projecting the three-dimensional object model to a two-dimensional image;

a first sharpness extraction unit for extracting a first sharpness amount reflecting the sharpness from each of the plurality of comparison images;

a weighted difference calculator for calculating a plurality of weighted differences by weighting the first sharpness amount to the difference between the input image and each of the comparison images;

a determination unit for selecting a comparison image having the smallest weighted difference among the plurality of weighted differences and estimating an optimal pose based on the selected comparison image; and

a second sharpness extraction unit for extracting a second sharpness amount reflecting the sharpness from the input image,

wherein the weighted difference calculator calculates a plurality of weighted differences by weighting the difference between the second sharpness amount of the input image and the first sharpness amount of each of the comparison images to the difference between the input image and the comparison image, and

wherein the first and second sharpness amounts are defined by an edge image or a characteristic point.

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6. (Canceled)

7. (Currently amended) A pose estimation and comparison system employing the pose estimation system according to Claim [[2]] 1, wherein the determination unit further performs object comparison by comparing the minimum weighted difference of the estimated optimal pose with a predetermined threshold value.

8. (Currently amended) The pose estimation and comparison system according to Claim [[6]] 7, wherein the weight becomes higher as the sharpness of the image becomes higher in the weighted difference calculation.

9. (Canceled)

10. (Currently amended) A [[The]] pose estimation and comparison system employing the pose estimation system according to Claim [[7]] 5, wherein the first and second sharpness amounts are defined by an edge image or a characteristic point determination unit further performs object comparison by comparing the minimum weighted difference of the estimated optimal pose with a predetermined threshold value.

11. (Currently amended) A comparison system for performing object comparison by comparing an input image with an object model, comprising:
a comparison image generation unit for generating a plurality of comparison images similar to the input image from the object model;
a first sharpness extraction unit for extracting a first sharpness amount reflecting the sharpness from each of the plurality of comparison images;
a weighted difference calculator for calculating a plurality of weighted differences by weighting the first sharpness amount to the difference between the input image and each of the comparison images; [[and]]
a determination unit for performing object comparison by comparing the calculated plurality of weighted differences with a preset threshold value; and

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a second sharpness extraction unit for extracting a second sharpness amount reflecting the sharpness from the input image;

wherein the weighted difference calculator calculates a plurality of weighted differences by weighting the difference between the second sharpness amount of the input image and the first sharpness amount of each of the comparison images to the difference between the input image and the comparison images, and

wherein the first and second sharpness amounts are defined by a ratio of a number of pixels whose edge intensity is a threshold value or higher to the total number of pixels, a range of brightness values, dispersion of brightness values, or a number of characteristic points.

12. (Canceled)

13. (Original) The comparison system according to Claim 11, wherein the weight becomes higher as the sharpness of the image becomes higher in the weighted difference calculation.

14. (Canceled)

15. (Currently amended) A [[The]] comparison system ~~according to Claim 12,~~ for performing object comparison by comparing an input image with an object model, comprising:

a comparison image generation unit for generating a plurality of comparison images similar to the input image from the object model;

a first sharpness extraction unit for extracting a first sharpness amount reflecting the sharpness from each of the plurality of comparison images;

a weighted difference calculator for calculating a plurality of weighted differences by weighting the first sharpness amount to the difference between the input image and each of the comparison images;

a determination unit for performing object comparison by comparing the calculated plurality of weighted differences with a preset threshold value; and

a second sharpness extraction unit for extracting a second sharpness amount reflecting the sharpness from the input image;

wherein the weighted difference calculator calculates a plurality of weighted differences by weighting the difference between the second sharpness amount of the input image and the first sharpness amount of each of the comparison images to the difference between the input image and the comparison images, and

wherein the first and second sharpness amounts are defined by an edge image or a characteristic point.

16. (Currently amended) A pose estimation method for performing object pose estimation by comparing an input image with a three-dimensional object model, the method comprising:

generating at least one pose candidate;

generating, according to the pose candidate, a plurality of comparison images similar to the input image, while projecting the three-dimensional object model to a two-dimensional image;

extracting a first sharpness amount reflecting the sharpness from each of the plurality of comparison images; [[and]]

calculating a plurality of weighted differences by weighting the first sharpness amount to the difference between the input image and each of the comparison images;

selecting a comparison image having the smallest weighted difference among the plurality of weighted differences;

estimating an optimal pose based on the selected comparison image; and

extracting a second sharpness amount reflecting the sharpness from the input image,

wherein a plurality of weighted differences are calculated by weighting the difference between the second sharpness amount of the input image and the first sharpness amount of each of the comparison images to the difference between the input image and the comparison image in the calculation of the weighted differences, and

wherein the first and second sharpness amounts are defined by a ratio of a number of pixels whose edge intensity is a threshold value or higher to the total number of pixels, a range of brightness values, dispersion of brightness values, or a number of characteristic points.

17. – 47. (Canceled)